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CASTANEA

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All persons interested in the botany of the Southern Appalachian Mountains are invited to join the club. Dues, including subscription to the Journal, are $3.00 per year. Single copies of *Castanea*, seventy-five cents.

Notes and short scientific papers relating to the botany of the region are welcomed and will be published to the extent that the size of the Journal allows.

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CASTANEA

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Vol. 15 September, 1950 No. 3

Some Fresh-Water Algae from Mississippi

L. A. WHITFORD

While engaged in malaria control work during the spring and summer of 1945, the writer was able to make a few collections of fresh-water algae in Mississippi. Most of the collections are from the vicinity of Greenville in the Mississippi River valley or delta. Some were made with a plankton net.

Except for a very cursory examination at the time of collection to determine whether a collection was worth saving, all study and identification was done several years later on samples preserved in formalin-alcohol (Transeau's solution). Due to poor care some of the material was in such bad condition that no drawings are submitted for publication, even of such rare species as *Draparnaldia ravenellii* and *Phaeosphaera perforata*.

Seventy species and five additional varieties are reported together with a brief note on the habitat and locality where collected and the month when the collection was made. Species are listed under the proper class with no detailed systematic arrangement.

The following species are apparently reported for the first time from the United States: *Oedocladium operculata* and *Sirogonium melanosporum*.

CHLOROPHYCEAE

GONIUM PECTORALE Mueller. Rare in a small pond south of Leland, August.

PANDORINA MORUM Bory. Common among *Lemna* and *Wolffia* plants in a pond near Leland. Also found in a borrow pit at Wayside and a pool near Lake Washington, May to August.

EUDORINA ELEGANS Ehr. Common in a small lake at Leland and also in ponds at Wayside and Chatham, May to August.

VOLVOX ROUSSELETII? West. Colonies ellipsoid to ovoid, 870-1386 micra in diameter; the short axis up to 100 micra less than the long.

Vegetative cells over 14,000 per colony with cytoplasmic connections between cells; cells stellate in polar view. Zygotes 69-238 per colony, mostly in the posterior half; spiny, spines acute and slightly curved. Diameter of zygotes 51-53 micra; without spines 39-43 micra. Two collections were made in small pools near Lake Washington in April. Both collections had only late sexual stages. If, as seemed to be true, the species is heterothallic, there is little doubt the species is the above. Unfortunately the collections dried up spoiling the vegetative cells before a careful study was made with Smith's monograph at hand. After seeing the remaining material, Smith says, "At least it is a species in the section *Euvolvox* not previously reported from the United States, or, for that matter, the northern hemisphere."

VOLVOX sp. A collection in a small pond at Wayside (May) had a number of colonies in vegetative condition and some with gonidia. Careful staining of preserved material indicates the cytoplasmic threads connecting cells are very delicate and that there is no gelatinous material in center of colony. If these observations are correct, the species belongs to the section *Copelandosphaera* and should be *V. dissipatrix*, heretofore known only from the Orient.

SPHAEROCYSTIS SCHROETERI Chodat. Among aquatics and other algae in seepage pools near the levee at Greenville, July.

GLOEOCYSTIS GIGAS (Kuetz) Lagerh. In the plankton of a small lake at Leland, June.

TETRASPORA GELATINOSA (Vouch) Desv. In small swamp pools, Leland, May.

CYLINDROCAPSA GEMINELLA Wolle. In seepage pools near the river Greenville, Summer 1945.

DRAPARNALDIA RAVENELII Wolle. Main filaments 121-127 micra diam. Cells 100-154 micra long. The small, sessile, spherical, fascicles little exceeding the diameter of the main filament make this species easy to identify. The numerous large jointed hairs first noted by Transeau are also characteristic of the species. In small pools. Leland, May 13, 1945.

APHANOCHAETE REPENS A. Br. On *Sirogonium melanosporum* at Greenville, August, 1945.

PROTOCOCCUS VIRIDIS Ag. Common on fences and wood near barns and the bark of trees.

OEDOGONIUM INCONSPICUUM Hirn. Cells 4.5-6 x 18-27 micra. Oogonium 18 x 18 micra. This little known species was collected in a swamp pond near Leland in March.

OEDOGONIUM WABASHENSE Tiffany. In swamp pools, Leland, May.

BULBOCHAETE TENUIS (Wittr.) Hirn. In small swamp pools near Leland, March.

BULBOCHAETE NORVEGICA (Wittr.) Tiffany. With the above species.

OEDOCLADIUM OPERCULATA Tiffany. This species was collected on loam soil along a swampy creek bank near Lake Washington, 20 miles south of Greenville, Miss. It grows among moss protonema and thalloid liverworts in a habitat quite similar to that where the writer has found *O. lewisii* in North Carolina. The tufts of filaments are finer in texture, however, and more easily distinguished from moss protonema with a hand lens. Vegetative material was fairly abundant in July and fruiting began early in August. The material was entirely typical. This seems to be the first collection in the United States. Previously collected in Puerto Rica and India. It is the writer's belief that several species of *Oedocladium* are widespread in spring and autumn in the southeast.

PEDIASTRUM DUPLEX var. COHAERENS Bohlin. Rather rare, but found in several pools at Greenville and also in the plankton of Lake Washington, May, June, July.

PEDIASTRUM DUPLEX var. GRACILLIMUM W. & G. S. West. Fairly common in the lake at Leland, June.

PEDIASTRUM DUPLEX var. RETICULATUM Lagerh. In the lake at Leland, June.

PEDIASTRUM SIMPLEX Mayen. In the plankton, Lake Washington, May.

HYDRODICTYON RETICULATUM (L) Lagerh. Abundant in seepage pools near the levees at Greenville, Miss. June to August, 1945.

DICTYOSPHAERIUM PLANCTONICUM Tiffany and Ahlstrom. Rare in the plankton, Lake Washington, May.

DICTYOSPHAERIUM PULCHELLUM Wood. Among *Lemna* and *Wolffia* plants in a pond near Leland, August.

ANKISTRODESMUS FALCATUS (Corda) Ralfs. Common in the plankton of a small pond at Chatham, August.

ANKISTRODESMUS SPIRALIS (Turner) Lemm. In the plankton, Lake Washington, May .

SCENEDESMUS BIJUGA (Turk.) Lagerh. In seepage pools near the river, Greenville, and also in a pond at Chatham. Present all summer.

SCENEDESMUS BIJUGA var. FLEXUOSUS (Lemm.) Collins. From seepage pools at Greenville, Summer.

SCENDESMUS OBLIQUUS (Turp.) Kuetz. Among *Lemna* and *Wolffia* plants in a pond near Leland and a pool at Chatham, August.

SCENEDESMUS QUADRICAUDA (Turpin) Breb. Rare in the plankton of Lake Washington, May.

CRUCIGENA QUADRATA Morren. Rare in a pond near Leland, August.

VAUCHERIA spp. *Vaucheria* is common on wet soil in spring in all localities. Fruiting was not observed. Probably most fruiting, as in North Carolina, is in winter.

ZYGNEMA MAJUS Czurda. The spores did not seem to be quite mature but were entirely typical and showed the light blue mid-wall. Leland swamp, March. Two other species of *Zygnema* were found in the same pool but were not in identifiable condition.

SIROGONIUM MELANOSPORUM (Rao) Transeau.[1] Cells 64-80 x 122-152 micra, ends plane, 6 chloroplasts slightly twisted. Spores ellipsoid, 91-97 x 131-166 micra with a median line, middle wall irregularly verrucose. From several pools near Greenville, August, 1945. This seems to be the first collection of this species in North America.

CLOSTERIUM LANCEOLATUM Kuetz. In a small lake at Leland, June.

CLOSTERIUM LIEBLEINII Kuetz. Fram a small pool in Leland swamp, March.

CLOSTERIUM VENUS Kuetz. In the plankton of Lake Washington, May.

COSMARIUM BLYTII ? Wille. This form seems to agree with the above species more closely than with *C. humile*. Lake Washington, May.

COSMARIUM CUCURBITA Breb. In a small pond south of Leland, August.

COSMARIUM HUMILE (Gay) Nordst. In the shallows of a pond at Chatham, August.

COSMARIUM PUNCTULATUM Breb. With the above species.

COSMARIUM PORTIANUM Arch. Among *Lemna* and *Wolffia* plants in a pond near Leland, August.

COSMARIUM PORTIANUM var. NEPHROIDEUM Wittr. In the plankton of Lake Washington, May.

COSMARIUM PYRAMIDATUM Breb. Among *Lemna* and *Wolffia* plants in a pond near Leland, August.

COSMARIUM REGNELLII Wille. With the above species.

COSMARIUM SUBTUMIDUM Nordst. With the above species.

STAURASTRUM DILITATUM Ehr. In the plankton of Lake Washington, (May) and a pond at Chatham, August.

STAURASTRUM LEPTOCLADUM Nordst. In the plankton of Lake Washington, May.

STAURASTRUM POLYMORPHUM Breb. In a small pond near Chatham, August.

[1]Identified by E. N. Transeau.

SPAEROZOMA GRANULATUM Roy & Bissett. With the above species.

CHAROPHYCEAE

CHARA CORONATA Ziz.[2] Abundant in seepage pools near the river at Greenville, June to August.

EUGLENOPHYCEAE

EUGLENA TRIPTERIS (Duj.) Ebbs. In the plankton of a small lake at Leland, July.

PHACUS LONGICAUDA (Ehr.) Duj. Collected with a net in a borrow pit at Wayside, May.

PHACUS PLEURONECTES (O. F. Meuller) Duj. Rare in a small pond south of Leland, August.

TRACHELOMONAS HISPIDA var. DUPLEX Defl. With the above species.

TRACHELOMONAS LACUSTRIS var. OVALIS (Drezepolski) Defl. From swamp pools, Leland, March.

TRACHELOMONAS VOLVOCINA Ehr. With the above variety.

CHLOROMONADINEAE

GONYOSTOMUM SEMEN Diesing. Common in a borrow pit at Wayside, May.

XANTHOPHYCEAE

BOTRYOCOCCUS BRAUNII Kutz. In the plankton of a small lake at Leland, June.

CHRYSOPHYCEAE

MALLOMONAS CAUDATA Ivanoff. Fairly common in a small lake at Leland and a borrow pit at Wayside, May and June.

PHAEOSPHAERA PERFORATA L. Whitford. Several small colonies of this recently described species were found attached to sticks and cattail stems in a marshy stream a few miles south of Hattiesburg early in March. This is the first collection at a distance from the locality where described. The species is probably rare but widespread in late winter in the southeast coastal plain.

MYXOPHYCEAE

CHROOCOCCUS LIMNETICUS var. SUBSALSUS Lemm. In a small pond near Lake Washington, August.

CHROOCOCCUS MINIMUS (v. Keissler) Lemm. In the plankton of a small lake at Leland, June.

MICROCYSTIS AERUGINOSA Keutz. In the plankton of a borrow pit at Wayside, May.

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[2]This species was identified by Fay K. Daily of Butler University.

MERISMOPEDIA PUNCTATA Meyen. In a small pond near Lake Washington, August.

MERISMOPEDIA TROLLERI Bachmann. Cells 3-4 micra in diam., in two series of fours; with pseudovacuoles. Colony long twisted. In a small swamp pool near Leland, Miss.

HOLOPEDIUM IRREGULARE Lagerh. In the plankton of a small lake, June.

GOMPHOSPHAERIA APONINA Keutz. One colony was collected in the lake at Leland, June.

TETRAPEDIA GELATINOSA (Vauch.) Desv. In a swamp pool near Leland, March.

OSCILLATORIA FORMOSA Bory. In the plankton of Lake Washington, May.

ANABAENA FLOSAQUE (Lyng.) Breb. Fairly common in the plankton of a small lake at Leland, and also in Lake Washington, May and June.

ANABAENA HASSALII (Kuetz.) Wittr. In the plankton of a small lake at Leland, June.

CYLINDROSPERMUM INDENTATUM G. S. West. In swamp pools near Leland, March.

NODULARIA HARVEYANA (Thwaites) Thur. In a swamp pool near Leland, March.

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Two Species of Rubus New for Massachusetts

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When I was a boy in my early teens I was as much interested in making collections of plants, insects and other natural history material as I am today. I was then living on a farm situated in the western part of the township of Oxford, Massachusetts, on the road leading to Dudley. Nearby was the beautiful natural pond known as Grassy Pond which extended its swales and woody swamps quite to the southern limits of our old farm. It was in a swale near here that I became interested in a rare blackberry which formed a small colony. Even as a boy I knew this blackberry was a rather unusual species, for I had never seen it anywhere else in the region, and I knew the flora for many miles around. That was 55 years ago when I was a boy of 15. I had been in correspondence with John Burroughs in those days, and also with F. Schuyler Mathews to whom I was indebted for much encouragement in my natural history interests. It was Mathews who encouraged me to send to him plants and musical insects that were of special interest to me. He relayed these to scientist friends in Cambridge who identified them. Specimens of my unusual, softly hispid, blackberry were thus identified for me as *Rubus setosus* Bigelow.

In 1949 Dr. L. H. Bailey's paper "Rubus studies—Review and additions," in Gentes Herbarum, Vol. 7, Fasc. 6, appeared. In this paper, pp. 486-487, he discussed the status of *Rubus setosus,* which he considers a major bewilderment among Rubus species. This revived old memories of my childhood blackberry identified as *Rubus setosus,* and in the early spring of 1949 I wrote to Dr. Bailey telling him about this, and that I should be glad to visit the area in June to secure material for him. Dr. Bailey was much interested and wrote me that he hoped I would make the effort to find the original colony, so during the last week of June I made the trip to Oxford for this purpose. Fortunately, although our old farm has been practically abandoned to brush and forest for many years, I found the old swale in a fair state of clearing, although the woods and shrubs had advanced some distance into it. In a short time I had found my blackberry colony and was able to secure a good series of material, both floricanes and primocanes, for the plants were in full flower.

This colony had not extended itself for some reason even though 55 years had passed, and although I searched other swales of similar character nearby I could find no other plants of this species. Some distance away in an old field bordering a swale near the north end

of Grassy Pond, I did find specimens of *Rubus pervarius*, raised to the status of a species by Bailey in the paper cited above (p. 514, fig. 254. This was previously considered to be a variety of *Rubus hispidus*, i.e. var. *pervarius* by him (Gent. Herb. 5, 75 (1941)).

My *Rubus setosus* originally so-called was identified by Dr. Bailey as *Rubus nigricans* Rydb. He characterizes this species in Gentes Herbarum, 5, 140, fig. 53 (1941). It would appear that *R. setosus* and *R. nigricans* in the past have been somewhat confused.

On receipt of my material of these two species, Dr. Bailey wrote me that I had sent him a very interesting set of *Rubus*, stating that these were the first collections of these two species from Massachusetts. *R. nigricans* had been previously collected in New York, Vermont and Quebec; *R. pervarius* from Vermont and Quebec.

Material of *R. nigricans* was collected under the author's numbers 19492, 19503, 19504 and 19505. *R. pervarius* was collected under the numbers 19499, 19500, 19507, 19508, 19526. Material has been deposited in the Bailey Hortorium at Ithaca, N.Y., in the U.S. National Herbarium, and the Herbarium of the National Arboretum, Washington, D. C.

Notes on the Plants of Harlan County, Kentucky

ROGER W. AND BERNICE L. BARBOUR

During the summer of 1948 the writers were engaged in a faunal survey of Big Black Mountain (elevation 4150 feet), Harlan County, Kentucky. Incidental to other work some 200 plant specimens were collected; all were identified by Dr. Robert Clausen of the Botany Department of Cornell University; all are deposited in the herbarium there.

Of the specimens collected, seven species are not listed in E. Lucy Braun's "An Annotated Catalogue of Spermatophytes of Kentucky" (1943, Planographed by John S. Swift Co., Inc., Cincinnati, Ohio); they are listed below:

Stellaria graminea L.
Ranunculus acris L.
Thalctrum polygamum Muhl.
Malva moschata L.
Gratiola lutea Rafin.
Eupatorium maculatum L.
Cirsium lanceolatum (L). Hill

All the above species, with the exception of *Malva moschata* L. were collected about the summit of Big Black Mountain, some four miles south of Lynch, at an elevation above 3800 feet. The *Malva* was collected from near a deserted stable at an elevation of 3500 feet in Razor Fork, not over two miles from the highest point in Kentucky.

OGLEBAY INSTITUTE
WHEELING, WEST VIRGINIA

Two Mid-Appalachian Violets

ROBERT B. PLATT

1. THE IDENTITY OF A NORTHERN WEST VIRGINIA VIOLET. In their recent paper on the violets of West Virginia, Davis and Davis (1949) identified one species which appeared to be new to the state as *Viola Walteri* House, on the basis of its stems rooting at the nodes. Since this entity is primarily a lowland plant, and since there seemed to be some discrepancies in the descriptive data given, Professor Edgar T. Wherry of the University of Pennsylvania entered into correspondence with these authors, and on the basis of a specimen they kindly submitted decided that the identification was incorrect. Since the present writer is familiar with the violets of the southern Appalachians, Dr. Wherry suggested that he look further into the matter.

Both the mountain occurrence and the descriptive data furnished suggested the possibility that the plant in question might be *Viola labradorica* Schrank. The careful checking of herbarium material from all parts of Pennsylvania in connection with the preparation of a new flora of that state by Drs. Fogg, Wahl, and Wherry, had already shown that a violet, closely related to if not identical with the northern entity usually so-named[1], grows in this state. It is found in two disjunct areas, one in the general Pocono Plateau region toward the northeastern corner, the other in the high Appalachian Plateau country toward the southwest corner, adjoining the parts of Maryland and West Virginia in which the violet under discussion is found. While the ultimate determination of this violet as *V. labradorica* added a new species to the West Virginia flora, *V. Walteri* was removed, leaving a net gain of zero in species numbers.

The doubtful determination of these West Virginia violets, the intermediate species description given them, and their intermediate

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[1]In a recent article in Rhodora, Fernald (1949) stated that he was unable to distinguish *Viola labradorica* Schrank from *V. adunca* Sm. var. *minor* (Hook.) Fd., and that since the latter name has priority, it should stand. He pointed out that this "variety" extends 900 miles further north than typical *V. adunca*, and at its ...nern limit in the East it ascends into alpine areas, typical *V. adunca* in the East never doing so. While such extensions into alpine areas occur in New York and northern Pennsylvania, usually considered the southern limit of *V. labradorica*, this observation does not correspond very well with the occurrence of the entity here under discussion in southern Pennsylvania, western Maryland, and northern West Virginia, where "alpine" areas are not noted for their development. Dr. Davis, by personal correspondence, states that these plants, although growing in the mountain counties, usually occur at moderate elevations (up to 3000 ft.) along streams.

geographical distribution justified a careful comparison of these with both *V. Walteri* and *V. labradorica.* For this comparison, specimens from Pennsylvania and Maryland, similar to those of West Virginia, and also representing southern extensions of the customarily given range of *V. labradorica,* were grouped with the West Virginia ones, making a total of 14 specimens of this category available. The distribution of these 14 specimens, representing the known southern range extension of *V. labradorica,* is given in figure 1. Thirteen specimens of *V. labradorica* from northeastern North America and 15 specimens of *V. Walteri from* 7 southeastern states were used as checks.

Ten presumptive species characters were sought on each specimen. No significant differences were demonstrable between the two groups

Fig. 1

Figure 1. Southern range extension, *Viola labradorica* Schrank, not including Wayne and Monroe County Statons in northeastern Pennsylvania. Since the map was made, Nicholas County, bordering Webster on the southwest, has added to the range.

of *Viola labradorica*, except that some of the southern group rooted at the nodes. The only clearly definitive characters between the two species proved to be those concerning stipular teeth and pubescence on the upper and lower leaf surfaces, petioles, and peduncles. *V. labradorica* has small sparse stipular teeth and is glabrous except for scattered hairs on the upper leaf surface. On the other hand *V. Walteri* can be immediately identified by its shaggy or deeply laciniate toothed stipules and by the dense covering of short white stiff hairs all over the leaves and peduncles, which accordingly actually glisten in the sun. Characters concerned with flower size, such as sepal length and spur size, frequently overlap. Those which indicate vegetative growth, as leaf shape and size and stipular length and width, overlap to the extent that they are of no diagnostic value at all. The character "rooting at the nodes", usually associated with *V. Walteri* (Small 1933), and primarily responsible for the misidentification leading to the preparation of this note) is of no diagnostic significance. Node-rooting was observable in 5 specimens of *V. labradorica* from Pennsylvania, and in 3 specimens of *V. Walteri*.

The two species are moreover disjunct in geographical distribution. *V. Walteri* is customarily reported as found "from Kentucky southward". Braun (1943) records it from "Dry limestone ledges in Carter Co." which would be at an altitude of around 750 feet. It is not known from West Virginia and only from the southwestern part of Virginia. Though Patterson (1939) does not include it in his checklist of Virginia violets, Wherry (personal communication) observed it growing in loamy depressions in limestone ledges along a brook 5 miles northeast of Buchanan in Botetourt County, this representing its northeastern limit as known to date. The elevation, 1200 feet, is also the greatest *Viola Walteri* is known to reach.

Appreciation is expressed to Dr. Wherry for his counsel, to Dr. and Mrs. Davis for their help in correcting the error, and to the Gray Herbarium, the Herbarium of the University of Pennsylvania, and the West Virginia University Herbarium for the loan of specimens.

2. VIOLA PEDATIFIDA G. DON. IN SOUTHWEST VIRGINIA. *Viola pedatifida* G. Don, a prairie species ranging north from Ohio to Saskatchewan and southwest to New Mexico and Arizona, is well established in southwest Virginia on several shale barrens. Patterson (1939) reports that it was found by him on May 6, 1936, "in a shady ravine near a stream", Douthat State Park, Bath County, and that Artz found it in an "adjoining ravine" at the same time. The writer, in the summer of 1946, found this violet on southwest-facing shale

barrens along Wilson Creek on Road 629, 2.5 and 2.8 miles north of its intersection with Route 60, Alleghany County. Later he found it about 3 miles east of this locality on a south-facing shale barren overlooking the Cowpasture River 5.5 miles northeast of Clifton Forge in the same county.

V. pedatifida grows best on the more protected and moister tree shaded areas and rock crevices of these shale barrens, where also competition is almost lacking due to the great sparsity of surface plants. Patterson, in correspondence, agrees that the plants he and Artz found were growing under similar conditions in a "shady ravine", which was also the dry semi-shaded fringe of a typical shale barren. Failure to find these plants on nearby barrens, where conditions are equally favorable, indicates that they do not easily migrate. Failure to find them growing under different conditions on areas immediately adjacent to the shale barrens indicates they are restricted to this kind of habitat. The question of when *V. pedatifida* was introduced to this area is at present a purely speculative one. The restricted distribution, as well as an outward lack of variability with the species descriptions of the principal manuals would indicate that it is probably recent. Specimens have been deposited in the Herbarium of the University of Pennsylvania and Emory University Herbarium.

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Taxus in Piedmont Virginia

W. W. Diehl and F. R. Fosberg

Stimulated by the discovery of a planted specimen of *Taxus canadensis* Marsh, and information that it had been transplanted from a local wild colony, we searched for it along Bull Run, in Prince William Co., Virginia, in December 1949 and eventually succeeded in finding a single healthy shrub of this species at an elevation of approximately 200 feet growing from the face of a low cliff overhanging the stream, not far from the planted occurrences. The wild plant

is a vigorous individual with a number of well-developed stems from a common base, growing from under the roots of a large hemlock tree surrounded by a mixed patch of hemlock and deciduous trees. Specimens in budding condition were collected (*Fosberg and Diehl* 31149) and will be deposited in the herbarium of the U. S. National Arboretum as well as in certain other herbaria.

This find is of special interest in that no other site is known nearer than 50 miles to the west on Stonyman Mountain at an elevation of about 2500 feet in the Blue Ridge; furthermore the species appears never to have been found previously in the Piedmont province except far to the north of Virginia. Its situation on the face of a cliff as well as its close resemblance to the young hemlock seedlings common there may have contributed to the survival of this apparent relict. This similarity to young hemlock is a case of accidental protective mimicry that would have had no value until man with his propensity for digging up and transplanting rare plants arrived on the scene. Its effectiveness was well demonstrated when the junior author walked right by the planted specimen of *Taxus*, mistaking it for the hemlock with which it grew.

The transplant was rather dull in color and did not appear to be healthy while the one of the cliff was bright green. Since yew is ordinarily found on calcareous substrates, the nature of the cliff was investigated. It was formed by the stream cutting through gently dipping beds of the red-purple triassic shale that characterize the region southeast of the Bull Run Mountains. The bed immediately underlying the ledge on which the yew is growing appeared different from the others, and turned out to be a massive, finely crystalline rock considered to be a calcareous sandstone; it effervesces considerably with strong hydrochloric acid, showing that it has a fair carbonate content.

On the face of this bed was found a small but vigorous colony of *Asplenium rhizophyllum* L. (*Fosberg and Diehl* 31154) and a few plants each of *A. trichomanes* L. (31151), *A. platyneuron* (L). Oakes (31152), and *Cystopteris* species (31150). The surrounding shale was covered by an abundant and vigorous growth of exceptionally large plants of *Polypodium vulgare* L. (*P. virginianum* L.) (31153).

The status of this isolated plant of *Taxus* as a likely relict from the Pleistocene is made probable by the upstream dip of the stratum on which it is found. In an area of acid soils chiefly overlaying acid

shales and sandstones the exposure of this hard calcareous rock, marked by a low escarpment across the adjacent country, has probably existed for a long time, gradually becoming noticeable upstream as the surrounding country and the stream itself approached base level. Practically all these rock exposures are within fields subjected to cultivation or to pasturage with the immediate site of this single yew plant protected by its position on the cliff. A limited habitat suitable for yew could thus have continued since the time when the more normal climatic requirements of the plant existed much farther to the south than today.

CATHOLIC UNIVERSITY OF AMERICA
WASHINGTON

A Bit of the Flora in and Around an Old Iron Furnace

LENA ARTZ

Through a narrow, steep-walled, and rocky gorge described in the 1850's by Porte Crayon as "one of the most famous passes in the Virginia mountains", one enters the largest of the numerous small valleys that lie within the Massanutten Mt. system in Virginia.

This valley, lying behind the northern end of the Massanutten and partially within the George Washington National Forest, which surrounds it, is known as Powell's Fort. Like other valleys of this area Powell's Fort was formed by the wearing away of the less resistant limestones and shales and, like the other valleys, it is flanked on either side by steep quartzite ridges.

George Washington surveyed Powell's Fort and the surrounding Massanutten area. It was then that he became acquainted with this natural fortress which is entirely surrounded by mountains except at its northern end where the Gorge, or Fortsmouth, as it is sometimes called, provides a narrow passageway. Later, during the Revolutionary war, it was to this natural fortress, Powell's Fort, that Washington planned to retreat if he were defeated at Yorktown.

In this sheltered and lovely valley, drained by the clear, cool waters of Passage Creek and its tributaries, white settlers began around 1733 to make their homes.

The abundance of iron ore in the shales of the region and a plentiful supply of wood for the production of charcoal for use in the smelting of iron ore led to one of the most important industries in the valley, the making of pig iron.

After many years of thriving business, the iron furnaces, whose walls were built of Massanutten sandstone, were destroyed by the

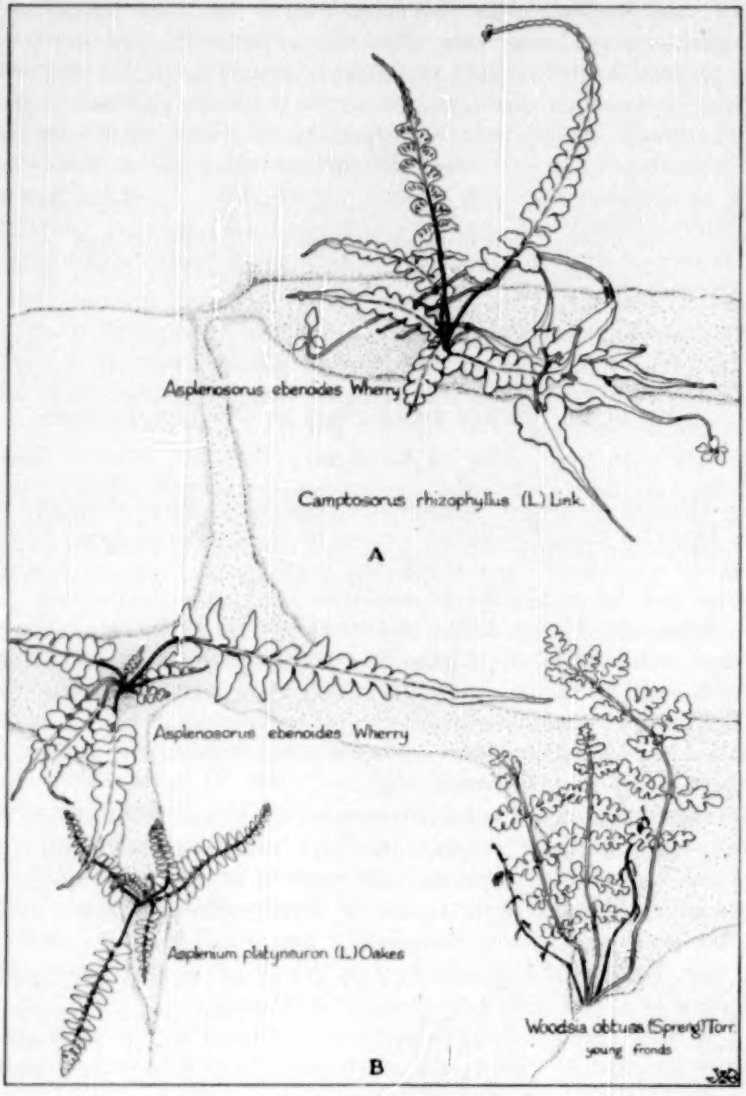

Fig. 1. Illustrator's interpretation of ferns as they grow in the crevices of a Pre-Civil War sandstone wall at an old iron furnace (Elizabeth Furnace). These two groups of ferns, A and B, are within 10 feet of each other on the wall and were drawn from life on September 3, 1944 due to the fact that repeated attempts to photograph the wall had failed. Only outlines of the damp, lichen-covered rocks and crevices have been included so as not to lead attention away from the ferns themselves. Sketched by Miss Jane W. Roller.

Federals during the Civil War. Shortly after the war, the walls of Elizabeth Furnace were rebuilt. However, the furnace then ran for a few months only. The iron industry in Powell's Fort became a thing of the past.

Elizabeth Furnace, from which Elizabeth Furnace Forest Camp takes its name, lies along the right bank of Passage Creek at an elevation of about 800 feet. The old walls are hidden from the eyes of casual observers by a growth of woody and herbaceous plants. Some of these are: *Acer negundo* L., Box Elder; *Acer rubrum* L., Red Maple; *Liriodendron tulipifera* L., Tulip Tree; *Celtis occidentalis* L., Hackberry; *Platanus occidentalis* (L.) Walt., Sycamore; *Rhus Toxicodendron* L., Poison Ivy; *Verbesina occidentalis* (L.) Walt., Crownbeard; at least two species of *Rubus*, common wild Blackberry and Raspberry, several species of grasses, among them Bromes, Panicums, and Bottlebrush grass.

In and around a moist spot which lies immediately in front of the largest wall grow *Benzoin aestivale* (L.) Nees, Spicebush; *Onoclea sensibilis* L., Sensitive Fern; *Juncus effusus* L., Candlerush; *Gentiana Andrewsii Griseb.*, Closed Gentian; *Scutellaria lateriflora* L., Maddog Skullcap, and other moisture loving plants.

The walls of the furnace proper are clothed with stunted trees, a few ferns, scattered weeds and grasses. The commonest plant here is *Poa compressa* L., Canada Bluegrass.

Near the tops of most of the old walls Poison Ivy is abundant. Mingled with it are Virginia Creeper, Galiums, and grasses. Growing on and near the bases of the walls are *Dryopteris marginalis* (L.) Gray, Marginal Fern, *Polypodium virginianum* L., Common Polypody, *Asplenium platyneuron* (L.) Oakes, Common Spleenwort; *Camptosorus rhizophyllus* (L.) Link, Walking Fern; and *Pellaea atropurpurea* (L.) Link, Purple Cliff Brake.

On one of the largest walls, eight by twelve feet, Catnip, Jewelweed, Nettles, and other weeds exist in the crevices of the moss and lichen covered rocks. At the north end of this wall Walking Fern covers rather densely an area of about fifteen square feet. This fern grows over the top, around the end, and at intervals across the length of the wall. Closely associated with it are *Asplenium platyneuron*, *Woodsia obtusa*, and two specimens of *Asplenosorus ebenoides* Wherry.

A bit of the mortar from this wall was found, by Jewell J. Glass of the U. S. Geol. Survey to consist of 44% calcium carbonate, the amount of this substance that is found in some calcareous sandstones.

The Elizabeth Furnace station is one of the three known ones for *Asplenosorus ebenoides* in Powell's Fort, Shenandoah County, Virginia. The other two stations are on calcareous sandstone.

WATERLICK, VIRGINIA

NOTES and NEWS

ATTENTION FIELD BIOLOGISTS—The streams of the Southeast are subject to development for power, navigation, flood control, water supply, and other purposes. Plans of river basin development are continually being studied by both public and private agencies, for the growth and progress of the region depend to a large extent on the water resources.

Development has been accelerated since the end of the war, and several dams have recently been completed. Construction is under way on others. A large number of projects have been authorized by Congress, preliminary permits for three have been granted by the Federal Power Commission, and various utilities have filed with the Commission Declarations of Intention to build hydroelectric projects.

Many of the areas will soon be lost to science for study. It is suggested that, whenever possible, plans should be made to make field studies in the areas to be inundated. During 1948 I made a vegetative survey of the Allatoona Reservoir Area near Cartersville, Georgia. During 1949 I studied the Clark Hill Area on the Savannah River. The studies have been exceptionally profitable. I can, therefore, recommend such areas for study. I hope biologists will attempt to make studies of other projects in the interest of preserving as much data as possible for posterity.

Information concerning the locations and sizes of the projects and the agency responsible for their construction is given in the accompanying table. Data for the projects which are not under construction are subject to change. No definite time has been set for the construction of the authorized projects, and many years may elapse before all are constructed. The listed projects do not comprise the full development of the river basin involved, and other projects will undoubtedly be added in the future.

The efforts and suggestions of Mr. G. W. McDowell in preparing the manuscript are gratefully acknowledged.—WILBUR S. DUNCAN.

Project	River Basin	Stream	Location of Dam River Mile	State	Elevation Power Res. (Feet M.S.L.)	Reservoir Area (Acres)	Status	Agency*
Salem Church	Rappahannock	Rappahannock	113.4	Virginia	——	——	Authorized	(1)
Gathright	James	Jackson R.	43.4	do	1,639	3,850	do	(1)
Falling Spring	do	do	35.1	do	1,371	300	do	(1)
Roanoke Rapids	Roanoke	Roanoke	137.5	N.Carolina	127	——	do	(1)
Gaston	do	do	144.9	do	200	——	do	(1)
Buggs Island	do	do	178.7	Virginia	312	——	Under Const.	(1)
Randolph	do	do	227.8	do	380	——	Authorized	(1)
Melrose	do	do	262.9	do	486	——	do	(1)
Taber	do	do	275.0	do	525	——	do	(1)
Leesville	do	do	293.7	do	597	——	do	(1)
Smith Mountain	do	do	314.2	do	780	——	do	(1)
Schoolfield	do	Dan R.	66.4	do	500	——	do	(1)
Stuart	do	Smith R.	5.2	do	655	——	do	(1)
Philpott	do	do	44.3	do	986	——	Under Const.	(1)
Reregulator	Santee	Congaree R.	50.0	S.Carolina	162	10,000	Prelim. Permit	(2)
Frost Shoals	do	Broad R.	5.0	do	230	8,900	do	(2)
Blairs	do	do	39.0	do	340	36,900	do	(2)
Clark Hill	Savannah	Savannah	222.7	Ga.-S.C.	330	78,500	Under Const.	(1)
Goat Island	do	do	262.6	do	430	6,380	Authorized	(1)
Middleton Shoals	do	do	280.7	do	475	1,450	do	(1)
Hartwell	do	do	290.0	do	660	56,500	do	(1)
Anthony Shoals	do	Broad R.	7.0	Georgia	400	14,400	do	(1)
Tallow Hill	do	do	38.1	do	610	18,500	do	(1)
Old Pickens	do	Keowee R.	7.5	S.Carolina	800	8,400	Decl. of Intent	(3)
Camp Creek	do	Chattooga R.	5.1	Ga.-S.C.	1,022	127	Authorized	(1)
Rogues Ford	do	do	11.3	do	1,317	253	do	(1)
Sand Bottom	do	do	17.7	do	1,458	115	do	(1)
War Woman	do	do	20.5	do	1,640	3,110	do	(1)
Furman Shoals	Altamaha	Oconee R.	149.2	Georgia	337	15,000	Under Const.	(4)
Jim Woodruff	Apalachicola	Apalachicola	112.5	Florida	77	37,500	do	(1)
Upper Columbia	do	Chattahoochee R.	49.5	Ga.-Ala.	165	34,500	Authorized	(1)
Buford	do	do	348.5	Georgia	1,065	34,000	do	(1)

Project	River Basin	Stream	Location of Dam River Mile	State	Elevation Power Res. (Feet M.S.L.)	Reservoir Area (Acres)	Status	Agency*
Millers Ferry	Alabama	Alabama	145.0	Alabama	80	24,700	do	(1)
Jones Bluff	do	do	249.9	do	125	13,500	do	(1)
Howell Mill Shoals	do	Coosa R.	103.5	do	470	17,700	do	(1)
Queens Creek	Tuckasegee	Queens Cr.	——	N.Carolina	——	——	Decl. of Intent.	(5)
White Oak Creek	do	White Oak Cr.	——	do	——	——	do	(5)
do	do	Dicks Cr.	——	do	——	——	do	(5)
Tuckasegee	do	Tuckasegee	52.3	do	——	——	do	(5)
Cedar Cliff	do	East Fork	——	do	——	——	do	(5)
Bear Creek	do	do	——	do	——	——	do	(5)
Island Ford	do	do	——	do	——	——	do	(5)
do	do	Robinson Cr.	0.3	do	——	——	do	(5)
Wolf Creek	do	East Fork	——	do	——	——	do	(5)
do	do	Wolf Creek	1.7	do	——	——	do	(5)
do	do	Slickens Cr.	——	do	——	——	do	(5)
do	do	Doe Branch	——	do	——	——	do	(5)
do	do	Unnamed Br.	——	do	——	——	do	(5)
Watauga	Tennessee	Watauga R.	36.7	Tennessee	1,959	6,400	Under Const.	(6)
South Holston	do	S. Fork Holston	49.8	do	1,729	8,000	do	(6)
Wolf Creek	Cumberland	Cumberland	460.9	Kentucky	723	63,530	do	(1)
Center Hill	do	Caney Fork R.	26.6	Tennessee	648	23,060	do	(1)
Jessamine	Kentucky	Kentucky	136.0	Kentucky	——	——	Authorized	(1)
Booneville	do	South Fork	237.0	do	——	——	do	(1)
Falmouth	Licking	Licking	62.0	do	——	——	do	(1)
Cave Run	do	do	173.0	do	——	——	do	(1)
Mining City	Green	Green	103.8	do	——	——	do	(1)
Rough River	do	Rough	89.3	do	——	——	do	(1)

*Agencies are as follows:

(1) Corps of Engineers
(2) Lyles Ford Tri-County Auth.
(3) Blue Ridge Elec. Coop.
(4) Georgia Power Co.
(5) Nantahala Power & Light Co.
(6) Tenn. Valley Authority

ROBERT MARSHALL TETRICK II—Robert Marshall Tetrick II was drowned June 23, 1950 in the Greenbrier River near Hinton, W. Va. An undercurrent may have been too strong for him or a heart attack may have caused his death. He was born June 9, 1929.

Young Tetrick, known by his relatives, friends and associates as Bob or Bobby, was an ardent student of the ferns and the fern allies. For his age Bob was undoubtedly the best fern student ("fernologist") in West Virginia. He tried to find all the fern variations he could wherever he went in search of plants. He not only knew the ferns well but he had a very wide knowledge of trees and other seed plants.

This summer he was on the West Virginia University biological field expedition with Dr. E. Meade McNeill as his instructor.

Bob Tetrick was an honor student in the Buckhannon (W. Va.) High School. Upon his graduation he was granted a West Virginia Wesleyan scholarship. He spent his freshman year at Wesleyan. Then he entered the University in his sophomore year. During that year he became a member of the Kappa Alpha social fraternity and a member of Phi Epsilon Phi, honorary botanical fraternity. He was elected treasurer of this fraternity during his junior year and this past spring he was chosen as president of this fraternity for next year (his senior year).

The writer probably took more field trips with Bob than did any other person. He found him to be a very careful observer and classifier. Although the writer never had Bob as a college student, he never had a college student that excelled Bob in the quest for ferns and other plants.

Young Tetrick's death means a very great loss to the University, the Southern Appalachian Botanical Club and the American Fern Society.—E. R. GROSE, SAGO, W. VA.

DOUBLE-FLOWERED HEPATICAS—Two double-flowered specimens of *Hepatica acutiloba* were found near the Lodge of Kanawha Trail Club, Charleston, West Virginia. These plants were growing about eight feet apart, each bearing from eight to twelve double flowers. The flowers consisted of sixty sepals, with pistils and stamens entirely absent. One plant had pure white sepals while the other had a slight pink tinge.—ALICE G. WILLIAMS.

BOOK REVIEWS

A Less-inaccurate Wild Flower Guide[1]—In a review published in the last issue of Castanea, a few of the almost incredible errors in a "popular" booklet on wild flowers were pointed out. Now another publication in the same field is at hand. This is a pocket-size volume of 157 pages, with excellent color plates, brief, well-written text, and alleged distribution maps of genera. In this work, the artist could count up to 10 or more, and so has shown the correct number of flower parts, the real position of leaves, and so on. Various errors occur here and there in the text, but they are not of such character as to mislead the user of the book.

On page 8 the purpose of the range maps is stated as "to indicate whether the flowers illustrated on that page occurs where you have found your specimen." With this laudable intention, it is surprising that the authors have shown such carelessness or indifference to reality. Thus, Painted-cups are shown (p. 26) as ranging only over the western half of the country, whereas a very showy species, indeed the one first known to science, occurs and attracts the attention of even non-botanists well over the eastern half. Meadow-beauties (p. 39) and Rose-Gentians (p. 41), indicated as wholly southern, actually extend north to Maine and Michigan. Anyone who has travelled along the St. Lawrence River in late summer would be inclined to doubt that Loosestrifes (p 52) do not grow north of Ohio and Pennsylvania. And there are striking Nemophilas and Bellworts in the Ozarks, Gilias and Eriogonums in Florida, Partridge-peas and Prickly-poppies in the upper midlands, and so on. Also, the number of species stated as included in genera or other groups is erroneous in at least 25 cases.

Although they should have had the data checked to attain greater accuracy, the publishers are to be congratulated on being able to put out such a beautifully illustrated work for so modest a price.—Edgar T. Wherry.

A New Textbook in Botany[2]—The production of a textbook in general botany that has a "different" look, in these days of a multitude of new books in the field, is somewhat of an achievement in itself, but the authors of this new *Botany* have been successful in breaking away from the conventional mode of presentation. The 480-page book is set in double column pages, with especial emphasis upon the 490

[1]Flowers. Herbert S. Zim and Alexander C. Martin, illustrated by Rudolf Freund. New York: Simon & Schuster. 1950. $1.00.

[2]Botany: An Introduction to Plant Science. W. W. Robbins and T. E. Weier. John Wiley and Sons, Inc. New York. 1950. $5.00.

illustrations carefully chosen to clarify points in the book. In many cases the figures are actually part of the reading matter itself, rather than illustrations of it. The illustrations are large and clear and are usually labeled direct, rather than in a legend.

The traditional subject matter of botany is presented, with especial emphasis upon the recent discoveries in the various fields. Growth substances, viruses, recent advances in photosynthesis, respiration, water relations, genetics, and other subjects are presented in the light of research up to the middle of the twentieth century.

To those who have long used the Engler-Prantl system of classification or some modification of it, the plan of classification used in this book may be one of the biggest surprises. Instead of the familiar four "divisions", Robbins and Weier have 15 "phyla". Ten of these correspond to the "thallophytes", with Phylum I including the fission plants, Phyla II to VIII the algae, and Phyla IX and X the fungi. Phylum XI is the Bryophyta, including mosses and liverworts. The last four phyla comprise the vascular plants, with Phylum XV being divided into Class I, Filicinae, Class II, Gymnospermae, and Class III, Angiospermae.

The book is pleasing in appearance, both without and within, and the authors have demonstrated that a book may be scientifically accurate and at the same time attractive to the eye. It is predicted that it will be one of the most successful books in its field.—Earl L. Core.

It Was Worth Waiting For!—Botanists of the northeastern States have asked each other for nearly a quarter of a century, "When will the new Manual appear?," and so many such queries came to M. L. Fernald, who was working on the revision, that he selected this question as the subject of an address presented at a national scientific meeting several years ago. It had been rumored that the Eighth Edition of Gray's Manual was to be a Centennial Edition, but when the 100th anniversary of the First Edition came (in 1948) without any announcement of publication, impatience was greatly increased. At last, in early summer of 1950, the long-awaited reference book appeared.[3] It is safe to say that no one botanical book has ever been awaited with such eagerness by so many people. But it was worth waiting for!

Dr. Fernald, who through the years has won a high reputation among his fellows as a very critical student of the plants of the north-

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[3]Gray's Manual of Botany, 8th (Centennial) Edition. Largely rewritten and expanded by Merritt Lyndon Fernald. New York: American Book Company. 1950. 1632 pp. Over 1800 illustrations. $9.50.

east, had devoted over 20 years to the accumulation of an endless mass of detail and the coordination of many thousands of separate items. Few works, other than Webster's Dictionary, have through most of the years of our country's history, been subjected to as much careful study and revision, and this reviewer is of the opinion that the present Edition has been the result of the most painstaking investigation of any in the long series.

The geographical range covered in the new Manual is the same as in the Seventh Edition, except that it was extended eastward to include all of the Gaspé Peninsula, Anticosti, and Newfoundland. The ranges of the various species are given in a scrupulously accurate manner, from the examination of actual collections. Flowering and fruiting periods are given in the same careful manner. The analytical keys to families, genera and species have been amplified and and stated in clear language. Dichotomous keys are regularly used, instead of the synoptic keys used in previous editions. Technical names are explained in simple language and in such a way that students may see in what manner they are appropriate. Colloquial names of familiar plants are given, including names used in French-speaking Quebec. The meanings of generic, specific and varietal names are given, including the translation of such simple words as *alba*, for the benefit of those without a knowledge of Latin.

Numerous detailed illustrations show the distinguishing characteristics of species in difficult groups. Many drawings of the Seventh Edition were retained and hundreds of new ones were added.

Because Dr. Fernald has been a very critical reviewer himself, it is certain that many reviewers of this book will be eager to point out the imperfections of his own work. But they will be obliged to search diligently to find errors, either of typography or in the subject matter. In reviewing a book that has been so carefully prepared by the most thorough polishing, it seems almost like straining a point to indicate the relatively few slips this reviewer has noted. But is is realized that the author and publisher may wish to eliminate some of these in future impressions and it is in this spirit that they are here mentioned.

On p. 504, *S. caroliniana* should be No. 2 in the genus Salix, not No. 1. On p. 583, under *Polygonum pensylvanicum* var. *eglandulosum*, Essex County should be in Ontario, not Ohio. On p. 1134, the status of *V. pallidum* is not clear. Why is it not numbered in the series with the other species of *Vaccinium*? On p. 1479 the common name yerba-de-Tago probably should be spelled yerba-de-Tajo. On p. 1567 the name *H. Traillii* is apparently misspelled.

By no means all the many species of *Rubus* described by Bailey are included, even though 205 species are listed. Many of Bailey's names are placed in synonymy. It would have been desirable if all those names could have been disposed of in one way or another. Not all the names to which reference is made in the text are in the Index. *Rubus Gordonii* (p. 831) for instance, is omitted. In the Index, *Rubus connixus* is printed in Roman type, indicating a recognized species, whereas, on p. 831 the name appears as a synonym of *Rubus Baileyanus*. *Rubus difformis* is out of alphabetic order in the Index.

It might have been easier to have overlooked the omission of many of Bailey's new names, even though he has been the leading student of the group for many years, had not Fernald coined so many new names in the genus himself.

The present reviewer would not presume in most instances to suggest corrections in the subject of the work. It would seem, however, that the inclusion of *Ilex longipes* Chapm. (p. 981) in the Manual range is based upon a mistaken report. The plant collected rather widely in the mountains of West Virginia (and, to a limited extent, of Virginia), previously identified as that species, seems certainly distinct and deserves to be called *Ilex collina* E. J. Alexander, the yellow-fruited form then becoming *f. Vantrompi* (Brooks) Core & Davis.

It is gratifying to note that Prof. Fernald has been a reader of CASTANEA!—EARL L. CORE.

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